

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A mirror structure comprising:

a self-deforming mirror mounted on a passive flexible support structure said mirror having a piezo electric actuator that is bonded to a mirror substrate, and including electrodes for applying electric fields to selected regions of the actuator layer to thereby deform the mirror substrate without applying forces to the support structure,

the support structure comprising, one or more passive flexible support elements attached to the piezo electric actuator of arranged to provide a supporting surface on which the self-deforming mirror is mounted, wherein the support structure is arranged to enable a deformation response in the self-deforming mirror mounted thereon such that the self deforming mirror is operable to adopt a predetermined deformation profile by the application of electrical fields across regions of the piezo-electric actuator.

2. (Previously Presented) The mirror structure as claimed in claim 1, wherein a plurality of said passive flexible support elements are spatially arranged to support the self-deforming mirror from below, with each of the support elements having an end shaped for providing support to the self-deforming mirror and a

flexible portion that connects the supporting end of the support element to a body portion of the support structure.

3. (Previously Presented) The mirror structure as claimed in claim 2, wherein at least one of the support elements is generally L-shaped such that one leg of the L-shape provides the flexible portion and the other leg of the L-shape provides the supporting end of the support element.

4. (Cancelled)

5. (Previously Presented) The mirror structure as claimed in claim 25, wherein each of the support elements is comprising:

a plurality of spatially-distributed support elements positioned so as to be in supportive contact with a different electrode of the self-deforming mirror mounted thereon actuator.

6. (Previously Presented) The mirror structure as claimed in claim 2, wherein the support elements are formed of compliant epoxy/rubber material.

7. (Previously Presented) The mirror structure as claimed in claim 2, wherein the supporting end of each support element is formed of compliant epoxy/rubber material and the remainder portion of each support element is formed of metal material.

8. (Previously Presented) A deformable mirror holder comprising a body with a receiving portion for receiving a deformable mirror wherein the receiving portion is defined by a passive flexible support structure such that, in use, the support structure provides a supporting surface to the mirror,

wherein the support structure comprises a plurality of discrete flexible support elements spatially arranged to support the mirror substrate from below, with each of the support elements having an end shaped to provide support to the mirror substrate and a flexible portion that connects the element's end to the holder's body, and

wherein the support elements are formed of a conducting compliant foam such that they permit electrical connection to a number of mirror electrodes.

9. (Previously Presented) The mirror structure as claimed in claim 2, wherein the support elements are formed as integral parts of the body portion of the support structure.

10. (Previously Presented) The mirror structure as claimed in claim 6, wherein the compliance of compliant material selected to form at least a portion of each of the support elements varies according to an established position of the support element in the support structure.

11. (Previously Presented) The mirror structure as claimed in claim 10, wherein the compliance of the selected compliant material varies according to the

distance of the respective support element from the edge of a supported mirror substrate.

12. (Previously Presented) The mirror structure as claimed in claim 6, wherein the compliance of each of the support elements varies according to the position of the support element in the support structure.

13. (Previously Presented) The mirror structure as claimed in claim 12, wherein the compliance of each of the support elements varies according to the length of the support element.

14. (Previously Presented) The mirror structure as claimed in claim 12, wherein the compliance of each of the support elements varies according to the cross-sectional area of the support element.

15. (Previously Presented) The mirror structure as claimed in claim 12, wherein the compliance of each of the support elements varies according to the compliance of the compliant material used to form the support element.

16. (Previously Presented) The mirror structure as claimed in claim 1, wherein the support structure comprises a generally solid unitary structure with compliant characteristics, which unitary structure is arranged to extend across the entire width of the self-deforming mirror surface for support thereof from below.

17. (Previously Presented) The mirror structure as claimed in claim 16, wherein the unitary structure is formed of epoxy/rubber material.

18. (Previously Presented) The mirror structure as claimed in claim 16, wherein the unitary structure includes a number of hole sections for permitting access to a number of electrodes of the self-deforming mirror when mounted thereon.

19. (Previously Presented) The mirror structure as claimed in claim 16, wherein the unitary structure includes a number of metallic interconnections permitting connection to a number of electrodes of the self-deforming mirror when mounted thereon, which metallic interconnections are arranged to respond to the deformation of the unitary structure in use.

20. (Previously Presented) The mirror structure as claimed in claim 16, wherein the compliance of the unitary structure varies according to the distance from the edge of the unitary structure.

21. (Previously Presented) The mirror structure as claimed in claim 20, wherein the unitary structure comprises a plurality of discrete annuli each composed of a compliant material having a different compliance.

22. (Previously Presented) The mirror structure as claimed in claim 20, wherein the thickness of the unitary structure varies according to distance from the edge of the unitary structure.

23. (Previously Presented) The mirror structure as claimed in claim 16, wherein the unitary structure is composed of a compliant material having substantially uniform compliance and a thickness of the unitary structure varies according to distance from the edge of the unitary structure.

24. (Canceled)

25. (Currently Amended) The ~~[[mirror]]~~ structure as claimed in claim 38 ~~[[1]]~~, wherein the self deforming mirror comprises a reflective surface provided on the substrate, the morphing ~~[[and a]]~~ layer of ~~deformable material attached to the~~ substrate that is operable to deform the mirror the piezo electric actuator comprising a piezoelectric element and electrodes for applying operating potentials thereto.

26. (Previously Presented) The mirror structure as claimed in claim 25, comprising a cooling system.

27. (Previously Presented) The mirror structure as claimed in claim 26, wherein said cooling system comprises a number of interconnecting conduits which are joined to form a continuous through-passage, enabling coolant to be admitted and circulated therethrough.

28. (Previously Presented) The mirror structure as claimed in claim 24, further comprising a tip-tilt stage.

29. (Canceled)

30. (Canceled)

31. (Previously Presented) The mirror structure as claimed in claim 1, wherein the required deformation response for the self-deforming mirror includes a resonant frequency for the self-deforming mirror mounted on the support structure.

32. (Previously Presented) The mirror structure as in claim 1, wherein the deformation response for the self-deforming mirror includes a required stroke characteristics for the self-deforming mirror mounted on the support structure.

33. (Previously Presented) The mirror structure as claimed in claim 25, wherein the self-deforming mirror is a bimorph self-deforming mirror, the piezoelectric actuator comprising having at least one layer of deformable material piezoelectric material as said piezoelectric element.

34. (Previously Presented) The mirror structure as claimed in claim 25, wherein at least some of the support elements are disposed in equi-spaced

relationships in a circular arrangement, each positioned so as to be in contact with one or more mirror of the electrodes when in use.

35. (Previously Presented) The mirror structure of claim 25, wherein the electrode includes a common electrode disposed between the mirror substrate and the piezoelectric element.

36. (Previously Presented) The mirror structure of claim 35, wherein the common electrode step is disposed on an upper surface of the piezoelectric element and an array of electrodes are disposed on a lower surface of the piezoelectric element.

37. (Previously Presented) The mirror structure of claim 36, wherein the array of electrodes is disposed between the piezoelectric element and the one or more passive flexible support elements.

38. (Currently Amended) A mirror structure comprising:
a self-deforming mirror; and
a passive flexible support structure comprising one or more passive flexible support elements on which the self-deforming mirror is supported,
wherein the support structure is arranged to enable a deformation response in the self-deforming mirror thereon, and
wherein the self-deforming mirror comprises a mirror substrate that defines a reflective mirror surface, and at least one morphing layer bonded to the substrate

and actuable to deform the mirror substrate by applying loads thereto ~~other than~~
~~through~~ without applying loads to the flexible support elements.